

Claims

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1. (Amended) A monotone conversion apparatus characterized in that it is provided with a picture acquisition unit for expressing a picture in picture elements in a dot matrix form and acquiring picture data representing each picture element in gradation of prescribed element colors into which an original color is separated;

a luminance distribution totaling unit for totaling the luminance equivalent of each picture element on the basis of these picture data;

a luminance correspondence setting unit for setting a correspondence relationship for collective accomplishment of conversion so that, while converting the pertinent luminance distribution on the basis of the totaled luminance distribution, relative proportions among element colors be adjusted to prescribed values correspondingly to luminance values after luminance conversion; and

a picture data conversion unit for generating monotone picture data in which the luminance of each picture element in said picture data is converted on the basis of this set correspondence relationship.

2. (Amended) A monotone conversion apparatus, as set forth

in Claim 1, characterized in that said luminance correspondence setting unit, in adjusting relative proportions among element colors to prescribed values, achieves smooth variation over the whole range of tone levels while realizing certain relative proportions in luminance equivalent terms by utilizing a tone curve.

3. (Amended) A monotone conversion apparatus, as set forth in Claim 1 or 2, characterized in that said luminance correspondence setting unit generates a plurality of conversion tables matching individual ones of said correspondence relationships, and generates an integrated conversion table to integrate these conversion tables.

4. (Amended) A monotone conversion apparatus, as set forth in Claim 3, characterized in that said luminance correspondence setting unit causes conversion tables matching said individual correspondence relationships to have tone ranges more detailed than the tone range of said integrated conversion table.

5. (Amended) A monotone conversion apparatus, as set forth in Claim 1 or 2, characterized in that said luminance correspondence setting unit said correspondence relationships on the basis of the result of successive execution of computations

representing the individual correspondence relationships.

6. (Amended) A monotone conversion method picture characterized in that it is provided with a picture acquisition step to express a picture in picture elements in a dot matrix form and acquire picture data representing each picture element in gradation of prescribed element colors into which an original color is separated;

a luminance distribution totaling step to total the luminance equivalent of each picture element on the basis of these picture data;

a correspondence setting step to set a correspondence relationship for collective accomplishment of conversion so that, while converting the pertinent luminance distribution on the basis of the totaled luminance distribution, relative proportions among element colors be adjusted to prescribed values correspondingly to luminance values after luminance conversion; and

a picture data conversion step to generate monotone picture data in which the luminance of each picture element in said picture data is converted on the basis of this set correspondence relationship.

7. (Amended) A monotone conversion method, as set forth

in Claim 6, characterized in that at said luminance correspondence setting step, in adjusting relative proportions among element colors to prescribed values, smooth variation is achieved over the whole range of tone levels while realizing certain relative proportions in luminance equivalent terms by utilizing a tone curve.

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8. (Amended) A monotone conversion apparatus, as set forth in Claim 6 or 7, characterized in that said luminance correspondence setting unit generates a plurality of conversion tables matching individual ones of said correspondence relationships, and generates an integrated conversion table to integrate these conversion tables.

9. (Amended) A monotone conversion method, as set forth in Claim 8, characterized in that at said correspondence setting step conversion tables matching said individual correspondence relationships have tone ranges more detailed than the tone range of said integrated conversion table.

10. (Amended) A monotone conversion method, as set forth in Claim 6 or 7, characterized in that at said correspondence setting step said correspondence relationships are set on the basis of the result of successive execution of computations

representing the individual correspondence relationships.

11. (Amended) A medium recording thereon a monotone conversion program for causing a computer to express a picture in picture elements in a dot matrix form, acquire picture data representing each picture element in gradation of prescribed element colors into which an original color is separated, and thereby generate monotone picture data, said monotone conversion program being characterized in that it is provided with:

a luminance distribution totaling step to total the luminance equivalent of each picture element on the basis of these picture data;

a luminance correspondence setting step to set a correspondence relationship for collective accomplishment of conversion so that, while converting the pertinent luminance distribution on the basis of the totaled luminance distribution, relative proportions among element colors be adjusted to prescribed values correspondingly to luminance values after luminance conversion; and

a picture data conversion step to generate monotone picture data in which the luminance of each picture element in said picture data is converted on the basis of this set correspondence relationship.

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12. (Amended) A medium recording thereon monotone conversion program, as set forth in Claim 11, said monotone conversion program being characterized in that at said luminance correspondence setting step, in adjusting relative proportions among element colors to prescribed values, smooth variation is achieved over the whole range of tone levels while realizing certain relative proportions in luminance equivalent terms by utilizing a tone curve.

13. (Amended) A medium recording thereon monotone conversion program, as set forth in Claim 11 or 12, said monotone conversion program being characterized in that at said luminance correspondence setting step a plurality of conversion tables matching individual ones of said correspondence relationships are generated, and an integrated conversion table to integrate these conversion tables is generated.

14. (Amended) A medium recording thereon monotone conversion program, as set forth in Claim 13, said monotone conversion program being characterized in that at said luminance correspondence setting step conversion tables matching said individual correspondence relationships have tone ranges more detailed than the tone range of said integrated conversion table.

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15. (Amended) A medium recording thereon monotone conversion program, as set forth in Claim 11 or 12, said monotone conversion program being characterized in that at said luminance correspondence setting step said correspondence relationships are set on the basis of the result of successive execution of computations representing the individual correspondence relationships.

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